

(Adopted August 3, 1990)(Amended September 7, 1990)(Amended August 12, 1994)
(Amended December 9, 1994)(Amended November 14, 1997)
(Amended June 3, 2005)

**PROPOSED AMENDED RULE 1110.2 EMISSIONS FROM GASEOUS- AND
LIQUID-FUELED ENGINES**

(a) Purpose

The purpose of Rule 1110.2 is to reduce Oxides of Nitrogen (NO_x), Volatile Organic Compounds (VOCs), and Carbon Monoxide (CO) from engines.

(b) Applicability

All stationary and portable engines over 50 rated brake horsepower (bhp) are subject to this rule.

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

- (1) AGRICULTURAL STATIONARY ENGINE is a non-portable engine used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. An engine used for the processing or distribution of crops or fowl or animals is not an agricultural engine.
- (2) APPROVED EMISSION CONTROL PLAN is a control plan, submitted on or before December 31, 1992, and approved by the Executive Officer prior to November 14, 1997, ~~describing all actions and alternatives, including a schedule of increments of progress to meet or exceed the requirements or applicable emissions limitations in paragraph (d)(1) that was required by subdivision (d) of this rule as amended September 7, 1990.~~
- (3) CERTIFIED SPARK-IGNITION ENGINES mean engines certified by California Air Resources Board (CARB) to meet emission standards in accordance with Title 13, Chapter 9, Article 4.5 of the California Code of Regulations (CCR).
- (4) EMERGENCY STANDBY ENGINE is an engine which operates as a temporary replacement for primary mechanical or electrical power during

periods of fuel or energy shortage or while the primary power supply is under repair.

- (5) ENGINE is any spark- or compression-ignited internal combustion engine, not including engines used for self-propulsion.
- (6) EXEMPT COMPOUNDS are defined in District Rule 102 - Definition of Terms.
- (7) FACILITY means any source or group of sources or other air contaminant emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in Section 55.2 of Title 40, Part 55 of the Code of Federal Regulations (40 CFR Part 55). Such above-described groups, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.
- (8) LOCATION means any single site at a building, structure, facility, or installation. For the purpose of this definition, a site is a space occupied or to be occupied by an engine. For engines which are brought to a facility to perform maintenance on equipment at its permanent or ordinary location, each maintenance site shall be a separate location.
- (9) NET ELECTRICAL ENERGY means the electrical energy produced by a generator, less the electrical energy consumed by any auxiliary equipment necessary to operate the engine generator and, if applicable, any heat recovery equipment, such as heat exchangers.
- (109) NON-ROAD ENGINE is any engine, defined under 40 CFR Part 89, that does not remain or will not remain at a location for more than 12 consecutive months, or a shorter period of time where such period is representative of normal annual source operation at a stationary source that resides at a fixed location for more than 12 months (e.g., seasonal operations such as canning facilities), and meets one of the following:

- (A) Is used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as a mobile crane); or
- (B) Is used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawn mowers and string trimmers); or
- (C) By itself, or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Transportability includes, but is not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting.

(11) OXIDES OF NITROGEN (NOx) means nitric oxide and nitrogen dioxide.

(129) PORTABLE ENGINE is an engine that, by itself or in or on a piece of equipment, is designed to be and capable of being carried or moved from one location to another. Indications of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, platform or mounting. The operator must demonstrate the necessity of the engine being periodically moved from one location to another because of the nature of the operation.

An engine is not portable if:

- (A) the engine or its replacement remains or will reside at the same location for more than 12 consecutive months. Any engine, such as a back-up or stand-by engine, that replaces an engine at a location and is intended to perform the same function as the engine being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of both engines, including the time between the removal of the original engine and installation of the replacement engine, will be counted toward the consecutive time period; or
- (B) the engine remains or will reside at a location for less than 12 consecutive months where such a period represents the full length of normal annual source operations such as a seasonal source; or
- (C) the engine is removed from one location for a period and then it or its equivalent is returned to the same location thereby circumventing the portable engine residence time requirements.

The period during which the engine is maintained at a designated storage facility shall be excluded from the residency time determination.

- (1~~34~~) RATED BRAKE HORSEPOWER (bhp) is the rating specified by the manufacturer, without regard to any derating, and listed on the engine nameplate.

(14) RICH-BURN ENGINE WITH A THREE-WAY CATALYST means an engine whose emissions of NOx, CO and VOC are simultaneously controlled by the catalyst when operated near stoichiometric conditions.

- (1~~52~~) STATIONARY ENGINE is an engine which is either attached to a foundation or if not so attached, does not meet the definition of a portable or non-road engine and is not a motor vehicle as defined in Section 415 of the California Vehicle Code.

- (1~~63~~) TIER 2 AND TIER 3 DIESEL ENGINES mean engines certified by CARB to meet Tier 2 or Tier 3 emission standards in accordance with Title 13, Chapter 9, Article 4 of the CCR.

(17) USEFUL HEAT RECOVERED means the waste heat recovered from the engine exhaust and/or cooling system that is put to productive use. The waste heat recovered may be assumed to be 100% useful unless the hot water, steam or other medium is vented to the atmosphere, or sent directly to a cooling tower or other unproductive use.

- (1~~84~~) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102.

(d) Requirements

- (1) Stationary Engines ~~Emission Limits~~:

(A) Operators of stationary engines with an amended Rule 1110.1 Emission Control Plan submitted by July 1, 1991, or an Approved Emission Control Plan, designating the permanent removal of engines or the replacement of engines with electric motors, in accordance with subparagraph (d)(1)(B), shall do so by December 31, 1999, or not operate the engines on or after December 31, 1999 in a manner that exceeds the emission concentration limits listed in Table I:

TABLE I ALTERNATIVE TO ELECTRIFICATION CONCENTRATION LIMITS		
NO _x	VOC	CO
(ppm) ¹	(ppm) ^{1,2}	(ppm) ¹
11	30	70

¹ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

² Measured as carbon, corrected to 15% oxygen on a dry basis and averaged over 30 minutes.

- (B) The operator of any other stationary engine subject to this rule shall
- (i) Remove such engine permanently from service or replace the engine with an electric motor, or
 - (ii) Not operate the engine in a manner that exceeds the emission concentration limits listed in Table~~ABLE~~ II.

TABLE II CONCENTRATION LIMITS		
NO _x <u>(ppm)¹</u>	VOC <u>(ppm)²</u>	CO <u>(ppm)¹</u>
(ppm)¹ <u>bhp ≥ 500: 36</u> <u>bhp < 500: 45</u>	(ppm)^{1,2} 250	(ppm)¹ 2000
<u>CONCENTRATION LIMITS</u> <u>EFFECTIVE JULY 1, 2010</u>		
<u>NO_x (ppm)¹</u>	<u>VOC (ppm)²</u>	<u>CO (ppm)¹</u>
<u>bhp ≥ 500: 11</u> <u>bhp < 500: 45</u>	<u>bhp ≥ 500: 30</u> <u>bhp < 500: 250</u>	<u>bhp ≥ 500: 70</u> <u>bhp < 500: 2000</u>
<u>CONCENTRATION LIMITS</u> <u>EFFECTIVE JULY 1, 2011</u>		
<u>NO_x (ppm)¹</u>	<u>VOC (ppm)²</u>	<u>CO (ppm)¹</u>
<u>11</u>	<u>30</u>	<u>70</u>

¹ Corrected to 15% oxygen on a dry basis and averaged over 15

minutes.

- ² Measured as carbon, corrected to 15% oxygen on a dry basis and averaged over 30 minutes.

- (C) Notwithstanding the provisions in subparagraph (d)(1)(B), the operator of any stationary engine fired by 90% or more of landfill or digester gas, based on the annual heat input (higher heating value) of the fuels, described in Table III shall not operate the engine in a manner that exceeds an emission concentrations of Table III. 2000 ppm by volume of CO corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes, or the emission concentration limits for VOC as carbon or NO_x specified by the following formula:

<p align="center"><u>TABLE III</u></p> <p align="center"><u>CONCENTRATION LIMITS FOR LANDFILL</u></p> <p align="center"><u>AND DIGESTOR GAS-FIRED ENGINES</u></p>		
<u>NO_x (ppm)¹</u>	<u>VOC (ppm)²</u>	<u>CO (ppm)¹</u>
<u>bhp ≥ 500: 36 x ECF³</u>	<u>Landfill Gas: 40</u>	<u>2000</u>
<u>bhp < 500: 45 x ECF³</u>	<u>Digester Gas: 250 x ECF³</u>	
<p align="center"><u>CONCENTRATION LIMITS</u></p> <p align="center"><u>EFFECTIVE JULY 1, 2012</u></p>		
<u>NO_x (ppm)¹</u>	<u>VOC (ppm)²</u>	<u>CO (ppm)¹</u>
<u>11</u>	<u>30</u>	<u>70</u>

- ¹ Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.

- ² Measured as carbon, corrected to 15% oxygen on a dry basis and averaged over 30 minutes.

- ³ ECF is the efficiency correction factor.

The ECF shall be 1.0 unless:

- (i) The engine operator has measured the engine's net specific energy consumption (q_a), in compliance with ASME Performance Test Code PTC 17 -1973, at the average load of the engine; and

(ii) The ECF-corrected emission limit is made a condition of the engine's permit to operate.

The ECF is as follows:

$$\text{ECF} = \frac{9250 \text{ Btu/hp-hr}}{\text{Measured } q_a \text{ in Btu/hp-hr}}$$

Measured q_a shall be based on the lower heating value of the fuel. ECF shall not be less than 1.0.

CONCENTRATION LIMIT FORMULA			
Concentration Limit	=	Reference Limit	\times <u>EFF</u> 25%

Where:

Concentration Limit = the allowable NO_x or VOC emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis, and averaged over 15 consecutive minutes.

Reference Limit = the NO_x or VOC emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis. The reference limits for various bhp ratings (continuous rating by the manufacturer) are listed in TABLE IV.

TABLE III
STATIONARY ENGINES DESCRIPTION
For electric power generation
Fired by landfill gas
Fired by sewage digester gas
Used to drive a water supply or conveyance pump except for aeration facilities
Fired by oil field produced gas
For integral engine compressor applications operating less than 4000 hours per calendar year

~~Fired by liquefied petroleum gas (LPG)~~

TABLE IV		
REFERENCE LIMITS, ppm		
Bhp Rating	NO_x	VOC
500 and greater	36	250
Greater Than 50 and Less Than 500	45	250

~~And,~~

~~EFF = the demonstrated percent efficiency at full load when averaged over 15 consecutive minutes of the engine only without consideration of any downstream energy recovery from the actual heat rate, in Btu/kW-hr, corrected to the HHV (higher heating value) of the fuel; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the engine after correction from LHV (lower heating value) to the HHV of the fuel, whichever efficiency is higher. The value of EFF shall not be less than 25 percent. Engines with lower efficiencies will be assigned a 25 percent efficiency for this calculation.~~

$$\text{EFF} = \frac{3413 \times 100\%}{\text{Actual Heat Rate at HHV of Fuel (Btu/kW-hr)}}$$

~~or~~

$$\text{EFF} = (\text{Manufacturer's Rated Efficiency at LHV}) \times \frac{\text{LHV}}{\text{HHV}}$$

(D) The operator of any new engine subject to subparagraph (e)(~~12~~)(B) shall:

- (i) Comply with the requirements of Best Available Control Technology in accordance with Regulation XIII if the engine requires a District permit; or

- (ii) Not operate the engine in a manner that exceeds the emission concentration limits in ~~Table~~**ABLE** I if the engine does not require a District permit.

(E) By June 1, 2008, the operator of an engine without a Rule 218-approved continuous emission monitoring system shall equip and maintain the engine with an air-to-fuel ratio controller with an oxygen sensor and feedback control.

(F) New Non-Emergency Electrical Generators

- (i) All new non-emergency engines driving electrical-generators shall comply with the following emission standards, based on the emission standards of the Distributed Generation Certification Program, Article 3, Subchapter 8, Chapter 1, Division 30, Title 17 of the California Code of Regulations, that became effective on January 1, 2007:**

<u>TABLE IV</u>	
<u>EMISSION STANDARDS FOR NEW ELECTRICAL GENERATION ENGINES</u>	
<u>Pollutant</u>	<u>Emission Standard (lbs/MW-hr)¹</u>
<u>NO_x</u>	<u>0.07</u>
<u>CO</u>	<u>0.10</u>
<u>VOC</u>	<u>0.02²</u>

- 1. The averaging time of the emission standards is 15 minutes for NO_x and CO and 30 minutes for VOC, except as described in the following clause.**
 - 2. Mass emissions of VOC shall be calculated using a ratio of 16.04 pounds of VOC per lb-mole of carbon.**
- (ii) Engines subject to this subparagraph that produce combined heat and electrical power may include one megawatt-hour (MW-hr) for each 3.4 million Btus of useful heat recovered, in addition to each MW-hr of net electricity**

produced. The compliance of such engines shall be based on the following equation:

$$\frac{\text{Lbs}}{\text{MW-hr}} = \frac{\text{Lbs}}{\text{MW}_e\text{-hr}} \times \text{Electrical Energy Factor (EEF)}$$

Where:

Lbs/MW-hr = The calculated emissions that shall comply with the emission standards in Table IV

Lbs/MW_e-hr = The short-term engine emission limit in pounds per MW_e-hr of net electrical energy produced, averaged over 15 minutes. The engine shall comply with this limit at all times.

EEF = The annual MW_e-hrs of net electrical energy produced divided by the sum of annual MW_e-hrs plus annual MW_{th}-hrs of useful heat recovered. The engine operator shall demonstrate annually that the EEF is less than the value required for compliance.

(iii) For combined heat and power engines, the short-term emission limits in lbs/MW_e-hr and the maximum allowed annual EEF must be selected by operator and stated on the operating permit.

(iv) This subparagraph does not apply to: engines installed prior to June 1, 2007; engines issued a permit to construct prior to June 1, 2007 and installed within 12 months of the date of the permit to construct; or landfill or digester gas-fired engines that meet the requirements of subparagraph (d)(1)(C).

(2) Portable Engines:

~~(A) The operator of any portable engine subject to this rule shall:~~

~~(i) By December 31, 1999, not operate the engine in a manner that exceeds the emission concentration limits of TABLE V for spark ignition engines, or the emission requirements of TABLE VI for compression ignition engines;~~

- (ii) ~~By January 1, 2010, meet the most stringent emissions standard which is the applicable emissions standard in effect and set forth in Title 13 of the CCR for that engine rating. If no emissions standard exists under the CCR, then the applicable emissions standard set forth in 40 CFR Part 89 shall apply. If no standard exists under the CCR and 40 CFR Part 89, then the applicable requirements of TABLE V for spark ignition engines or TABLE VI for compression-ignition engines shall apply; and~~
- (iii) ~~Submit to the Executive Officer a letter certifying that the engine is in compliance with the provisions of the subparagraph, in accordance with the compliance schedule in paragraph (e)(2).~~

TABLE V PORTABLE SPARK IGNITION ENGINE CONCENTRATION LIMITS		
NO _x	VOC	CO
80 ppm³ (1.5 g/bhp-hr)	240 ppm³ (1.5 g/bhp-hr)	176 ppm³ (2.0 g/bhp-hr)

³ ~~Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.~~

TABLE VI PORTABLE COMPRESSION IGNITION ENGINE EMISSION REQUIREMENTS	
Rated Brake Horsepower	Requirements
Greater Than 50 And Less Than 117	770 ppm⁴ NO_x (10.0 g/bhp-hr), or turbocharger and 4 degree injection timing retard
Greater Than or Equal To 117 And Less Than 400	550 ppm⁴ NO_x (7.2 g/bhp-hr), or turbocharger and aftercooler/intercooler and 4 degree injection timing retard

Greater Than or Equal To 400	535 ppm ⁴ NO _x (7.0 g/bhp-hr), or turbocharger and aftercooler/intercooler and 4 degree injection timing retard
⁴ —Corrected to 15% oxygen on a dry basis and averaged over 15 minutes.	

(~~A~~B) The operator of any portable engine generator subject to this rule shall not use the portable generator for:

- (i) Power production into the electric grid, except to maintain grid stability during an emergency event or other unforeseen event that affects grid stability; or
- (ii) Primary or supplemental power to a building, facility, stationary source, or stationary equipment, except during unforeseen interruptions of electrical power from the serving utility, maintenance and repair operations, and remote operations where grid power is unavailable. For interruptions of electrical power, the operation of a portable generator shall not exceed the time of the actual interruption of power.

This subparagraph shall not apply to a portable generator that complies with emission concentration limits of Table I and the other requirements in this rule applicable to stationary engines.

~~(B) The operator of any portable diesel engine shall comply with the applicable requirements of the Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater, Sections 93116 – 93116.5 of Title 17 of the California Code of Regulations.~~

~~(C) The operator of any portable spark-ignited engine shall comply with the applicable requirements of the Large Spark Ignition Engine Fleet Requirements, Article 2, Chapter 15, Division 3, Title 13 of the California Code of Regulations.~~

(e) Compliance

~~(1) Portable Engines:~~

~~The owner/operator of portable engines subject to the provisions of subparagraph (d)(2) shall:~~

~~(A) For engines for which engine modification or add-on control is used to comply with the applicable requirements of TABLE V for spark ignition engines, or TABLE VI for compression ignition engines:~~

~~(i) By April 30, 1998, submit applications for permit to construct and permit to operate engines;~~

~~(ii) By September 30, 1999, initiate engine modification or control equipment installation; and~~

~~(iii) By December 31, 1999, have engines in compliance with the applicable requirements of TABLE V for spark ignition engines, or TABLE VI for compression ignition engines.~~

~~(B) For engines for which engine modification or add-on control is used to comply with the most stringent emissions standard as set forth in clause (d)(2)(A)(ii):~~

~~(i) By April 30, 2008, submit applications for permit to construct and permit to operate engines;~~

~~(ii) By September 30, 2009, initiate engine modification or control equipment installation; and~~

~~(iii) By December 31, 2009, have engines in compliance with the most stringent emissions standard.~~

~~(C) By December 31, 2009, if the engines are in compliance with the most stringent emissions standard, submit to the Executive Officer a letter certifying that the engines are in compliance with the emissions standard.~~

(12) Agricultural Stationary Engines:

(A) The operator of any agricultural stationary engine subject to this rule and installed or issued a permit to construct prior to June 3, 2005 shall comply with paragraph (d)(1)(B) and the other applicable provisions of this rule in accordance with the compliance schedules in Table VI:

<u>TABLE VI</u> COMPLIANCE SCHEDULES FOR STATIONARY AGRICULTURAL ENGINES		
Action Required	Tier 2 and Tier 3 Diesel Engines, Certified Spark-	Other Engines

	Ignition Engines, and All Engines at Facilities with Actual Emissions Less Than the Amounts in the Table of Rule 219(ge)	
Submit notification of applicability to the Executive Officer	January 1, 2006	January 1, 2006
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	March 1, 2009	September 1, 2007
Initiate construction of engine modifications, control equipment, or replacement engines	September 30, 2009, or 30 days after the permit to construct is issued, whichever is later	March 30, 2008, or 30 days after the permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2010, or 60 days after the permit to construct is issued, whichever is later	July 1, 2008, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2010, or 120 days after the permit to construct is issued, whichever is later	September 1, 2008, or 120 days after the permit to construct is issued, whichever is later

The notification of applicability shall include the following for each engine:

- (i) Name and mailing address of the operator.
- (ii) Address of the engine location.
- (iii) Manufacturer, model, serial number, and date of manufacture of the engine.
- (iv) Application number
- (v) Engine type (diesel, rich-burn spark-ignition or lean-burn spark-ignition)
- (vi) Engine fuel type
- (vii) Engine use (pump, compressor, generator, or other)

- (viii) Expected means of compliance (engine replacement, control equipment installation, or electrification)
- (B) The operator of any new agricultural stationary engine that is not subject to the compliance schedule of subparagraph (e)(~~12~~)(A) for existing engines shall comply with the requirements of subparagraph (d)(1)(D) immediately upon installation.
- (3) ~~Agricultural Portable Engines:~~
- (A) ~~The operator of any agricultural portable engine subject to this rule shall comply with paragraph (f)(2) by January 1, 2006.~~
- (2) Non-Agricultural Stationary Engines:
- (A) The operator of any stationary engine not meeting the requirements of subparagraphs (d)(1)(B) or (d)(1)(C) that go into effect in 2010 or later, shall comply with those requirements in accordance with the compliance schedule in Table VI:

<u>TABLE VI</u> <u>COMPLIANCE SCHEDULE FOR NON</u> <u>-AGRICULTURAL STATIONARY ENGINES</u>	
<u>Action Required</u>	<u>Due Date</u>
<u>Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines</u>	<u>Twelve months before the final compliance date</u>
<u>Initiate construction of engine modifications, control equipment, or replacement engines</u>	<u>Three months before the final compliance date, or 30 days after the permit to construct is issued, whichever is later</u>
<u>Complete construction and comply with applicable requirements</u>	<u>The final compliance date, or 60 days after the permit to construct is issued, whichever is later</u>
<u>Complete initial source testing</u>	<u>60 days after the final compliance date in (d)(1)(B) or (d)(1)(C), or 120 days after permit to</u>

	<u>construct is issued,</u> <u>whichever is later</u>
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(B) The operator of any stationary engine that elects to amend a permit to operate to incorporate ECF-adjusted emission limits shall submit to the Executive Officer an application for a change of permit conditions by January 1, 2008, and comply with emission limits of the previous version of this rule until June 1, 2008 when the engine shall be in compliance with the emission limits of this rule.

(C) The operator of any stationary engine that is required to add operating restrictions to a permit to operate to meet the requirements of paragraph (h)(2), shall submit to the Executive Officer an application for a change of permit conditions by January 1, 2008.

(3) Stationary Engine CEMS

(A) The operator of any stationary engine with an existing CEMS shall commence the reporting required by Rule 218 Subdivision (f) on July 1, 2007. The first summary report for the six months ending June 30, 2007 shall be due on July 30, 2007.

(B) The operator of any stationary engine that is required modify an existing CEMS or install a CEMS on an existing engine, shall comply with those requirements in accordance with the compliance schedule in Table VII:

<u>TABLE VII</u> <u>COMPLIANCE SCHEDULE NEW OR MODIFIED</u> <u>CEMS ON EXISTING ENGINES</u>	
<u>Action Required</u>	<u>Due Date</u>
<u>Submit to the Executive Officer applications for new or modified CEMS</u>	<u>January 1, 2008</u>
<u>Complete installation and commence CEMS operation, calibration, and reporting requirements.</u>	<u>July 1, 2008</u>
<u>Complete certification tests</u>	<u>September 29, 2008</u>
<u>Submit certification reports</u>	<u>45 days after tests are</u>

<u>to Executive Officer</u>	<u>completed</u>
<u>Obtain final approval of CEMS</u>	<u>March 1, 2009</u>

(4) Stationary Engine Inspection and Monitoring (I&M) Plans:

The operator of stationary engines subject to the I&M plan provisions of subparagraph (f)(1)(D) shall:

(A) By January 1, 2008, submit an initial I&M plan application to the Executive Officer for approval;

(B) By May 1, 2008, implement an approved I&M plan or the initial I&M plan if the plan is not yet approved.

(5) Stationary Engine Air-to-Fuel Ratio Controllers

(A) The operator of any stationary engine that does not have an air-to-fuel ratio controller, as required by subparagraph (d)(1)(E), shall comply with those requirements in accordance with the compliance schedule in Table VI, except that the initial source testing may be conducted at the time of the bi-annual testing required by subparagraph (f)(1)(C).

(B) The operator of any stationary engine that has the air-to-fuel ratio controller required by subparagraph (d)(1)(E), but it is not listed on the permit to operate, shall submit to the Executive Officer an application to amend the permit by January 1, 2008.

(6) New Stationary Engines

The operator of any new stationary engine issued a permit to construct after June 1, 2007 shall comply with the I&M requirements and any applicable CEMS requirements of this rule when operation commences. The operator shall provide the required information in subparagraph (f)(1)(D) to the Executive Officer so that the I&M procedures can be included in the permit to construct. A separate I&M plan application is not required.

(f) Monitoring, Testing, ~~and~~ Recordkeeping and Reporting

(1) Stationary engines:

The operator of any engine subject to the provisions of paragraph (d)(1) of this rule shall meet the following requirements:

(A) Continuous Emission Monitoring

- (i) For engines of 1000 bhp and greater, and operating more than two million bhp-hr per calendar year, ~~install, operate and maintain in calibration~~ a NO_x continuous emission monitoring system (CEMS) shall be installed, operated and maintained in calibration to demonstrate compliance with the emission limits of this rule. ~~CEMS shall meet the requirements described in 40 CFR Part 60, particularly those in Appendix B, Spec. 2 and Appendix F, as well as the reporting requirements of 40 CFR Part 60 Sections 60.7(e), 60.7(d), and 60.13, and The CEMS shall include equipment that measures and records NO_x exhaust gas concentrations, corrected to 15 percent oxygen on a dry basis.~~
- (ii) On and after July 1, 2008, for facilities with engines subject to paragraph (d)(1), having a combined rating of 1000 bhp or greater at the same location, and having a combined fuel usage of more than 16 x 10⁹ Btu per year (higher heating value), CEMS shall be installed, operated and maintained in calibration to demonstrate compliance of those engines with the applicable NO_x and CO emission limits of this rule. Any engine located within 75 feet of another engine is considered to be at the same location. For engines rated below 1000 bhp, the CEMS may be time shared by multiple engines. The CEMS shall include equipment that measures and records NO_x and CO exhaust gas concentrations, corrected to 15 percent oxygen on a dry basis.
- (iii) All CEMS required by this rule shall comply with the applicable requirements of Rule 218, including equipment specifications and certification, operating, recordkeeping, quality assurance and reporting requirements.
- (iv) The operator of an engine that is required to install CEMS may request the Executive Officer to approve an alternative monitoring device (or system components) to demonstrate compliance with the emission limits of this rule. The applicant shall demonstrate to the Executive Officer that

the proposed alternative monitoring device is at a minimum equivalent in relative accuracy, precision, reliability, and timeliness to a CEMS for that engine, according to the criteria specified in 40 CFR Part 75 Subpart E. In lieu of the criteria specified in 40 CFR Part 75 Subpart E, substitute criteria is acceptable if the applicant demonstrates to the Executive Officer that the proposed alternative monitoring device is at minimum equivalent in relative accuracy precision, reliability, and timeliness to a CEMS for that engine. Upon approval by the Executive Officer, the substitute criteria shall be submitted to the federal Environmental Protection Agency (EPA) as an amendment to the State Implementation Plan (SIP).

If the alternative monitoring device is denied or fails to be recertified, a CEMS shall be required.

(viii) The monitoring system shall have data gathering and retrieval capability approved by the Executive Officer.

(B) Elapsed Time Meter

~~Maintain~~~~The engine shall have~~ an operational non-resettable totalizing time meter to determine the engine elapsed operating time.

(C) Source Testing

(i) ~~Conduct~~ ~~Provide~~ source testing ~~information regarding the exhaust gas, specifically~~ for NO_x, VOC reported as carbon, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) at least once every ~~two~~³ years, or every 8,760 operating hours, whichever occurs first. Relative accuracy tests required by Rule 218.1 or 40 CFR Part 75 Subpart E will satisfy this requirement for those pollutants monitored by a CEMS. If the engine has not been operated within three months of the date a source test is required, the source test shall be conducted when the engine resumes operation for a period longer than either seven consecutive days or 15 cumulative days of operation. The operator of the engine shall keep

sufficient operating records to demonstrate that it meets the requirements for extension of the source testing deadlines.

- (ii) Conduct source testing for at least 30 minutes during normal operation (actual duty cycle). This test shall not be conducted under steady state conditions unless they are the normal operation. In addition, conduct source testing for NOx and CO emissions for at least 15 minutes at an engine's actual peak load and for at least 15 minutes at actual minimum load, excluding idle. No pre-tests for compliance are permitted. The emission test shall be conducted at least 40 operating hours, or at least 1 week, after any engine servicing or tuning. If an emission exceedance is found during any of the three phases of the test, that phase shall be completed and reported. The operator shall correct the exceedance, and the source test may be immediately resumed.
- (iii) Use a contractor to conduct the source testing that is approved by the Executive Officer under the Laboratory Approval Program for the necessary test methods.
- (iv) Submit a source test protocol to the Executive Officer for written approval at least 60 days before the scheduled date of the test. The source test protocol shall include the name, address and phone number of the engine operator and a District-approved source testing contractor that will conduct the test, the application number(s) emission limits, and description of the engine(s) to be tested, the test methods and procedures to be used, a description of the critical parameters to be measured in accordance with the I&M plan required by subparagraph (f)(1)(D). The source test protocol shall be approved by the Executive Officer prior to any testing.
- (v) Provide the Executive Officer at least 30 days prior notice of any source test to afford the Executive Officer the opportunity to have an observer present. If after 30 days notice for an initially scheduled performance test, there is a delay (due to operational problems, etc.) in conducting the

scheduled performance test, the engine operator shall notify the Executive Officer as soon as possible of any delay in the original test date, either by providing at least seven days prior notice of the rescheduled date of the performance test, or by arranging a rescheduled date with the Executive Officer by mutual agreement.

(vi) Submit all source test reports, including a description of the equipment tested, to the Executive Officer within 45 days of completion of the test.

(vii) By June 1, 2008, provide, or cause to be provided, source testing facilities as follows:

(I) Sampling ports adequate for the applicable test methods. This includes constructing the air pollution control system and stack or duct such that pollutant concentrations can be accurately determined by applicable test methods.

(II) Safe sampling platform(s).

(III) Safe access to sampling platform(s).

(IV) Utilities for sampling and testing equipment.

(D) Inspection and Monitoring (I&M) Plan

Submit to the Executive Officer for written approval and implement an I&M plan for any engine not complying with the CEMS requirements of this rule. The I&M plan shall include:

(i) Procedures requiring the owner/operator to establish acceptable ranges for engine and control equipment operating parameters that source testing or portable analyzer testing has shown result in pollutant concentrations within the rule and permit limits. The parameters shall include, but not be limited to:

(I) Engine load;

(II) Oxygen sensor voltage output or equivalence ratio (phi);

(III) Catalyst inlet and outlet temperatures and the temperature change across the catalyst for rich-burn engines with three-way catalysts and air-to-fuel ratio controllers.

- (IV) Reactant (ammonia or urea) flow rate for lean-burn engines with selective catalytic control devices.
- (ii) Procedures for diagnosing emission control malfunctions and alerting the operator to the malfunction. Engine control systems shall have a malfunction indicator light and audible alarm.
- (iii) Procedures for at least weekly or every 150 engine operating hours, whichever occurs later, emissions checks by a portable NOx, CO and oxygen analyzer. If an engine is in compliance for three consecutive emission checks, without any adjustments to the oxygen sensor set points, then the engine may be checked monthly or every 750 engine operating hours, whichever occurs later, until there is a noncompliant emission check or the oxygen sensor is replaced. No engine or control system maintenance or tuning may be conducted within 72 hours of the emission check, unless it is an unscheduled, required repair. The portable analyzer shall be calibrated, maintained and operated in accordance with the manufacturer's specifications and recommendations and the Protocol for the Periodic Monitoring of Nitrogen Oxides, Carbon Monoxide, and Oxygen from Sources Subject to South Coast Air Quality Management District Rule 1110.2, approved on June 1, 2007, or subsequent protocol approved by EPA and the Executive Officer.
- (iv) Procedures for at least daily monitoring, inspection and recordkeeping of:
 - (I) the parameters identified by clause (f)(1)(D)(i);
 - (II) the engine elapsed time meter operating hours;
 - (III) the operating hours since the last emission check required by (f)(1)(D)(iii)
 - (IV) the deviation of the oxygen sensor voltage or equivalence ratio (ϕ) from the air-to-fuel ratio controller set point;
 - (V) engine control system and air-to-fuel ratio control system faults or alarms that affect emissions;

- The daily monitoring and recordkeeping may be done in person by the operator, or by remote monitoring.
- (v) Procedures and schedules for preventive and corrective maintenance;
 - (vi) For a rich-burn engine with three-way catalyst, procedures for using, whenever an oxygen sensor set point must be readjusted, or within 24 hours of an oxygen sensor replacement, a portable analyzer to verify or reestablish the acceptable range of the oxygen sensor output at minimum, midpoint and maximum load;
 - (vii) Procedures for reporting noncompliance to the Executive Officer. If an engine operator finds an engine to be operating outside the acceptable range for control equipment parameters, engine operating parameters, engine exhaust NO_x, CO, VOC or oxygen concentrations for a period of 15 minutes or longer, the operator shall: report the noncompliance within one hour in the same manner required by paragraph (b)(1) of Rule 430 – Breakdowns; immediately correct the noncompliance or shut down the engine within 24 hours or the end of an operating cycle, in the same manner as required by subparagraph (b)(3)(iv) of Rule 430; and comply with all requirements of Rule 430 if there was a breakdown.
 - (viii) Procedures and format for the recordkeeping of monitoring and other actions required by the plan;
 - (ix) Procedures for plan revisions. Before any change in I&M plan operations can be implemented, the revised I&M plan shall be submitted to and approved by the Executive Officer.

(E) Operating Log

Maintain a monthly engine operating log that includes:

- (i) Total hours of operation;
- (ii) Type of liquid and/or type of gaseous fuel;
- (iii) Fuel consumption (cubic feet of gas ~~and/or~~ gallons of liquid); and

- (iv) Cumulative hours of operation since the last source test required in subparagraph (f)(1)(C).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit.

(F) New Non-Emergency Electrical Generating Engines

Operators of engines subject to the requirements of subparagraph (d)(1)(F) shall also meet the following requirements.

- (i) The engine generator shall be monitored with an electric meter that measures the net electrical output of the engine generator system, which is the difference between the electrical output of the generator and the electricity consumed by the auxiliary equipment necessary to operate the engine generator.
- (ii) For engines monitored with a CEMS, the emissions of the monitored pollutants in lbs/MW_e-hr shall be calculated and recorded for the four 15-minute periods of each hour of operation. The mass emissions of NO_x shall be calculated based on the measured fuel flow and one of the F factor methods of 40 CFR 60, Appendix A, Method 19, or other method approved by the Executive Officer. Mass emissions of CO shall be calculated in the same manner as NO_x, except that the ppmvd CO shall be converted to lb/scf using a conversion factor of 0.727×10^{-7} .
- (iii) For NO_x and CO emissions from engines not monitored with a CEMS and VOC emissions from all engines, the emissions of NO_x, CO and VOC in lbs/MW_e-hr shall be calculated and recorded whenever the pollutant is measured by a source test or emission check. Mass emissions of NO_x and CO shall be calculated in the same manner as the previous clause. Mass emissions of VOC shall be calculated in the same manner, except that the ppmvd VOC as carbon shall be converted to lb/scf using a conversion factor of 0.415×10^{-7} .
- (iv) For engines generating combined heat and power that rely on the EEF to comply with Table IV emission standards,

the daily and annual useful heat recovered (MW_{th}-hrs), net electrical energy generated (MW_e-hrs) and EEF shall be monitored and recorded.

(v) Other methods of calculating mass emissions than those specified may be used if approved by the Executive Officer. All monitoring, calculation, and recordkeeping procedures must be approved by the Executive Officer.

(vi) Operators of combined heat and power engines shall submit to the Executive Officer the reports of the following information within 15 days of the end of the first year of operation, and thereafter within 15 days of the end of each calendar year: the annual net electrical energy generated (MW_e-hrs); the annual useful heat recovered (MW_{th}-hrs), the annual EEF calculated in accordance with clause (d)(1)(F)(ii); and the maximum annual EEF allowed by the operating permit. If the actual annual EEF exceeds the allowed EEF, the report shall also include the time periods and emissions for all instances where emissions exceeded any emission standard in Table IV.

(G) Portable Analyzer Operator Training

The portable analyzer tests required by the I&M Plan requirements of subparagraph (f)(1)(D) shall only be conducted by a person who has completed an appropriate District-approved training program in the operation of portable analyzers and has received a certification issued by the District.

(2) Portable engines:

The operator of any portable engine shall maintain a monthly engine operating log that includes:

- (i) Total hours of operation;
- (ii) Type of liquid and/or type of gaseous fuel; and
- (iii) Fuel consumption (cubic feet of gas ~~and/or~~ gallons of liquid).

Facilities subject to Regulation XX may maintain a quarterly log for engines that are designated as a process unit on the facility permit.

(3) Recordkeeping for All Engines

All data, logs, test reports and other information required by this rule shall be maintained for at least five years and made available for inspection by the Executive Officer.

(g) Test Methods

Testing to verify compliance with the applicable requirements shall be conducted in accordance with the test methods specified in ~~Table~~**ABLE** VIII, or any test methods approved by CARB and EPA, and authorized by the Executive Officer.

TABLE VIII	
TESTING METHODS	
Pollutant	Method
NO _x	District Method 100.1
CO	District Method 100.1
VOC	District Method 25.1* or District Method 25.3*

* Excluding ethane and methane

A violation of any standard of this rule established by any of the specified test methods, or any test methods approved by the CARB or EPA, and authorized by the Executive Officer, shall constitute a violation of this rule.

(h) Exemptions

The provisions of subdivision (d) shall not apply to:

- (1) All orchard wind machines powered by an internal combustion engine.
- (2) Emergency standby engines, engines used for fire-fighting and flood control, and any other emergency engines ~~as~~ approved by the Executive Officer, which have permit conditions that limit operation ~~to~~ 200 hours or less per year as determined by an elapsed operating time meter.
- ~~(3) Engines used for fire fighting and flood control.~~
- ~~(34)~~ Laboratory engines used in research and testing purposes.
- ~~(45)~~ Engines operated for purposes of performance verification and testing of engines.
- ~~(56)~~ Engines operating in the Eastern portion of Riverside County not within the South Coast Air Basin or the Salton Sea Air Basin.
- ~~(67)~~ Auxiliary engines used to power other engines or gas turbines during start-ups.

- (~~78~~) Supplemental engines which operate between November 1 of one year and April 15 of the following year for the manufacture of snow and/or operation of ski lifts.
- (~~89~~) Portable engines that are registered under the state registration program pursuant to Title 13, Article 5 of the CCR.
- (~~949~~) Nonroad engines, with the exception that subparagraph (d)(2)(~~AB~~) shall apply to portable generators.
- (~~104~~) Engines operating on San Clemente Island.
- (~~112~~) Agricultural stationary engines provided that:
- (A) The operator submits documentation to the Executive Officer by the applicable date in Table ~~VII~~ when permit applications are due that the applicable electric utility has rejected an application for an electrical line extension to the location of the engines, or the Executive Officer determines that the operator does not qualify, due to no fault of the operator, for funding authorized by California Health and Safety Code Section 44229; and
- (B) The operator replaces the engines, in accordance with the compliance schedule of Table IX, with engines certified by CARB to meet the Tier 4 emission standards of 40 CFR Part 1039 Section 1039.101, Table 1. These Tier 4 replacement engines shall be considered to comply with Best Available Control Technology; and
- (C) The operator does not operate the Tier 4 engines in a manner that exceeds the not-to-exceed standards of 40 CFR Section 1039.101, Paragraph (e), as determined by the test methods of subdivision (g) of this rule.

<u>TABLE IX</u> COMPLIANCE SCHEDULE FOR INSTALLATION OF NEW TIER 4 STATIONARY AGRICULTURAL ENGINES	
Action Required	<u>Due Date</u>
Submit to the Executive Officer applications for permits to construct engine modifications, control equipment, or replacement engines	March 1, 2013
Initiate construction of engine	September 30, 2013, or 30 days after the

modifications, control equipment, or replacement engines	permit to construct is issued, whichever is later
Complete construction and comply with applicable requirements	January 1, 2014, or 60 days after the permit to construct is issued, whichever is later
Complete initial source testing	March 1, 2014, or 120 days after the permit to construct is issued, whichever is later

(12) An engine start-up, until sufficient operating temperatures are reached for proper operation of the emission control equipment. In no case shall the start-up period exceed 15 minutes.